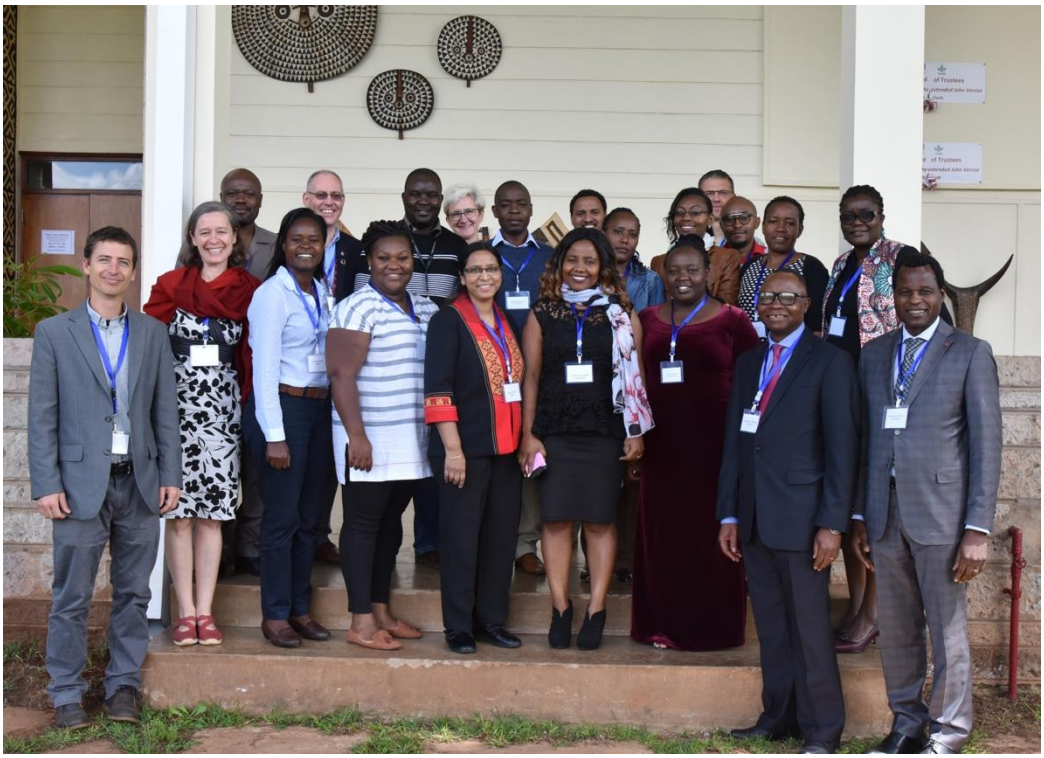
Improving Dietary and Health Data for Decision Making in Agriculture and Nutrition Actions in Africa

Project Inception Workshop, ILRI Campus

Nairobi, 1-2 November 2018

Workshop Report



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1. INTRODUCTION

The Food, Agriculture and Natural Resources Policy Analysis Network (FANRPAN) and the International Livestock Research Institute (ILRI) have just received funding from the International Development Research Centre (IDRC) to implement the project *Improving Dietary and Health Data for Decision Making in Agriculture and Nutrition Actions in Africa.*

Malnutrition remains an immense and universal problem, with at least one in three people globally experiencing malnutrition in some form (Global Nutrition Report, 2017). Globally, 155 million children under five years old are stunted, 52 million are wasted, while 2 million people lack important micronutrients such as iron and Vitamin A. The greatest share of all forms of malnutrition is borne by Africa and Asia; more than half of all stunted children under five live in Asia and more than one third live in Africa. In Africa, the number of stunted children under five years of age has increased from 50.4% in 2000 to 58.5 % in 2015 (UNICEF & Bank, 2015).

Malnutrition has direct consequences on child health and long term cognitive and physical development (Barker 1998; Alderman, Hoddinott, and Kinsey. 2006; Black et al. 2008; Victoria et al. 2008; Almond and Currie 2011). Governments and development organizations are more and more focusing on nutrition as a primary objective, as is illustrated by the Sustainable Development Goal (SDG) Target 2.2. A focus on nutrition can contribute to core areas - sustainable food production, strong systems of infrastructure, health systems, equity and inclusion, peace and stability - factors that are critical for meeting the SDGs (Global Nutrition Report, 2017).

There is a growing realization of the contribution of nutrition-sensitive interventions to complement nutrition-specific interventions in tackling undernutrition (Ruel et al., 2013). Evidence has shown that nutrition specific approaches alone when implemented at scale, with 90% coverage in the countries of the highest burden of malnutrition, can only resolve 20% of stunting (Bhutta et al., 2013). Agriculture has potential to address nutrition insecurity through the pillars of food security (availability, accessibility, utilization and stability). To attain food and nutrition security, there needs to be a combination of improved access, availability and utilization of food and health services. Sub-Saharan Africa has the highest level of food insecurity in the world, with an estimated 220 million people that lack adequate nutrition. Sub-Saharan Africa is the only region in the world to have experienced an increase in child stunting rates over the last two decades[1].

Reliable information, including data on dietary diversity, is critical in addressing malnutrition. However, poor access to accurate and reliable data on nutrition and health is hindering accountability and progress towards meeting the nutrition targets. Development practitioners and researchers know that there are few public databases available, and standard forms of primary data collection are extremely costly, especially in Sub-Saharan Africa. In addition, the common methods of collecting nutrition and health data are inadequate for tracking impacts in the face of heterogeneous, fast-moving, and difficult-to-observe confounding factors. For example, Sub-Saharan households may change consumption patterns frequently in response to changing environmental, seasonal, economic, and health conditions, while projects often rely on baseline and end-line surveys to investigate the impacts of their programs. While it is true that sophisticated implementation designs and statistics can provide insight into such situations, they can also miss important intertemporal activity at the household level. Standard baseline and endline surveys would miss the changes that take place between the two data points, resulting in potential misrepresentation of the nature of shocks, coping strategies, and their impact on nutrition and health—with implications for how practitioners and policymakers judge the impact of interventions aimed at improving household welfare.

Frequent assessments will help flag a deteriorating situation, including screening for individuals-women and children at risk of acute malnutrition - making it possible to trigger a response in early to avert

[1] http://data.unicef.org/topic/nutrition/malnutrition/#

potential adverse effects. While there are health information and record systems in a number of countries in Sub-Saharan Africa, rapid and accurate data collection at the lower levels still remains a challenge.

This project seeks to address this information gap by developing and building capacity on an information and communications technology-based (ICT-based) platform for collecting low-cost, high-frequency, high-resolution dietary and health data. The key innovation of this platform is to combine the accuracy and frequency of recording events in near-real time with the ease and support of ICT. The project will develop a system by which households will provide their own data directly—avoiding the scheduling, delays, and costs related to third-party enumerators—through a mobile platform that would not require high literacy, offering innovative reporting processes (e.g., icons, photos, interactive voice response, games) that can capture types of data that were previously very difficult to collect. These processes have the potential to reduce the burden that comparative surveys (e.g., paper-based consumption journals, socio-economic profiling) place on the household, while dramatically improving the data available for tracking and improving interventions. Households will also benefit directly from remuneration for data collection that is typically paid to enumerators. At the same time, the information will be processed and returned to participants in easy to understand and informative formats, providing households with important near-real-time information on their nutrition, dietary and health status, as well as aggregated data on comparative indicators to help them get a sense of where they are positioned relative to their community and to global references.

The overall objective of the project, therefore, is to develop, evaluate, and introduce cost-efficient and scalable solutions for improving the measurement of dietary intake and health indicators so as to make available valid, reliable and timely data to inform policy and programming and to track progress of nutrition and health outcomes at community and national levels, with global applicability.

The project objective will be met through the following three integrated specific objectives:

i) Develop cost-effective, scalable technologies to improve the collection of high-resolution (individual-level) dietary and health data;
ii) Strengthen country-, regional- and household-level capacity to use project-generated tools and data, to make data-driven agriculture, nutrition and health policy and practice decisions at each respective level;
iii) Ensure broad dissemination and advocacy for use of results by policy makers and other decision makers

2. OBJECTIVES OF INCEPTION WORKSHOP

The objectives of the project inception workshop were to officially launch the project, develop a common vision of the project through face to face discussions of the project objectives, outcomes and expectations, share contextual information from potential users of the research results, and develop action plans and detailed budgets. This was achieved through the following specific actions:

i) Officially launch the project

ii) Share information on IDRC and its food security program

iii) Share information on the state of malnutrition in arid and semi-arid lowlands (ASAL) of Kenya and the role of Ministry of Health

iv) Share information on UNICEF's and WFP's work in ASAL, the role of nutrition and M&E data and how the proposed research might contribute at scale to their work in providing data for combating malnutrition and influencing policy

v) Present an overview of the project, agriculture and food and nutrition security development challenges, research opportunities, objectives and expected outcomes.

vi) Discuss expectations of different stakeholders, including potential users of the research outputs

vii) Mobilize partners to action to participate in the implementation of the project.

viii) Discuss and agree on the research design, results framework and monitoring and evaluation framework, an action plan, gender and communication strategies, the roles of partners, and governance and management of the project.

3. PARTICIPANTS AND APPROACH TO THE WORKSHOP

The workshop participants comprised representatives of IDRC (funding partner), FANRPAN and ILRI staff working on the project, project managers from collaborating nutrition intervention projects, representatives of the Kenya Ministry of Health's Directorate of Nutrition and Dietetics Services, and representatives of UNICEF and other potential users of the tool to be developed (see Appendix 1 for list of participants).

The workshop approach was based on plenary sessions for information sharing and review and breakaway group work for detailed analysis and report back (see Appendix 2 for detailed programme). Three groups of participants discussed and reported on the following issues:

i) What data should the tool collect?
ii) Methods for testing the tool-functionality and comparison to traditional data collection methods
iii) Potential uses and scalability of the tool

4. OFFICIAL OPENING AND PROJECT LAUNCH

Mr Iain Wright, Deputy Director General, Research and Development-Integrated Science at ILRI, gave the welcome address. In the address he reflected on the stubbornly high levels of malnutrition and how that has implication on the socio economic welfare of the population. He noted that ILRI will continue to contribute to nutrition by promoting the role of livestock and animal source foods. He emphasised the need for new approaches to collect data on diets and health that would inform new ways of programming.

In his opening remarks, The FANRPAN CEO, Mr Munhamo Chisvo, recognised the existing challenge of addressing nutrition data gaps. He noted that the proposed ICT-based platform would be a form of empowering the vulnerable population. He highlighted the FANRPAN mandate and how this project perfectly fits within that mandate.

Dr Jemimah Njuki, IDRC Senior Specialist at the Nairobi Regional Office, made some opening remarks on behalf of Dr Kathryn Toure, the IDRC Regional Director, Sub-Saharan Africa. She gave a brief history of how the project idea was birthed during the Food Prize meeting in Iowa in 2017 where FANRPAN former CEO, herself and Andrew Mude from ILRI had a chat on how necessary it was to have an ICT tool for monitoring nutrition status. From that coffee break chat, a concept was born. It was exciting to see the project take off at last. She noted that IDRC was interested in seeing five issues being addressed through this project: importance of partnerships between the project and potential users of the application; ensure that no one is left behind in use of the proposed innovation, especially women and girls in measuring impact of intra-household dynamics; scaling up of impacts beyond testing communities, galvanising community of practice; be prepared to learn, even from negative results; relations hip between IDRC and project should be more of a partnership rather than that of a funder and recipient, hence stand ready to assist the project on request.

Ms Betty Samburu, Deputy Head of Nutrition and Dietetics, Kenya Ministry of Health, officially opened the meeting and launched the project. In her speech, Ms Samburu alluded to the timely launch of the project, that it will improve the measurements of dietary intake and health of the children, and at the same time, help track nutrition and health indicators. She noted how the project is critical to the implementation of the Government 4 Agenda on UHC and food security. She pointed out the challenges the Kenya Government faces where too few children get the required nutrition to survive, grow and develop and that the situation is dire in certain counties where children are most vulnerable to poor dietary intake. She indicated that the cost of malnutrition in Kenya is estimated to reach KShs3.2 trillion in the next 20 years and an estimated 527,000 lives will likely be lost due to malnutrition. This research will, therefore, build capacities and improve community based dietary habits. In her closing statement, she emphasised the

need for scaling up this innovation and called for all players to put in their efforts if Kenya's vision 2030, the SDGs and other national commitments are to be met.

5. INTRODUCTION TO IDRC

Dr Annie Wesley, Senior Nutrition Specialist responsible for the project at IDRC headquarters in Ottawa, made a presentation on IDRC's global development research program. She noted that IDRC is a key component of Canada's aid program, and supports research in developing countries to promote growth and development. IDRC works with developing countries to find solutions to problems they identify by supporting research, boosting research skills and sharing knowledge.

The Centre's strategic objectives for the period 2015-2020 include the following:

- Invest in knowledge and innovation for large-scale positive change;
- Build the leaders for today and tomorrow; and
- Be the partner of choice for greater impact.

IDRC has a global presence and works closely with researchers in the following regions: Asia, Latin America and the Caribbean, Middle East and North Africa and Sub-Saharan Africa. The focus programme areas are: agriculture and food security; climate change; and food, environment and health. Within the food security area, the focus is on responding to the growing demand for food, the most vulnerable (rural communities, women, youth and minorities), and environmental sustainability. She noted that IDRC supports the development and testing of innovations to improve food and nutrition security of the poorest using a combination of approaches to improve agricultural productivity, incomes and nutrition. This project fits into the food and nutrition security programme. She looked forward to collaboration with other projects working in this area.

6. STATE OF NUTRITION IN ASAL REGIONS OF KENYA AND THE ROLE OF THE MINISTRY OF HEALTH CONSTITUTIONAL MANDATE

Ms Lucy Kinyua, M&E Manager, Nutrition and Dietetics Unit, Ministry of Health in Kenya, made a presentation on the state of nutrition in the ASAL regions of Kenya and the role of Ministry of Health in upholding its constitutional mandate. She noted that the health and wellness of the citizens of Kenya is well protected through the constitutional mandate which recognises health through the following several commitments.

She noted that there has been a steady decrease in malnutrition in the country. Over a period of 20 years the statistics show that stunting has gone down from 33% to 26%, underweight from 22% to 11% and wasting had a minimal decrease of 2.1%. These decreases demonstrate a slow rate of reduction in malnutrition in the country.

Several efforts are in place to monitor child health and nutrition status. The Ministry of Health's monthly monitoring system of severe (SAM) and moderate acute malnutrition (MAM) has recorded the state of these conditions over a period offive5 years, tracking admission, discharge, relapse, deaths and defaulters. This system for managing acute malnutrition (screening for malnutrition, referral to the rehabilitation centres, monitoring of admitted children, and discharge of the cured) gives a comprehensive picture of status by county but specifically the situation in ASAL region, which has some of its counties highest hit with malnutrition.

The nutrition situation improved across counties in 2018, compared to the same season last year. However, several counties have still reported acute malnutrition levels above the emergency thresholds (GAM $\geq$ 15 percent). There have been significant improvements in food security following the exceptionally above average long rains which increased food availability and access due to substantial crop production, low market prices and available supplies in the local markets.

The drivers of acute malnutrition include disease/morbidity, poor dietary intake, poor coverage of immunization in some counties and poor hygiene and sanitation.

To properly function and address malnutrition challenges, the MOH has established a district health information system which feeds into the national level information system. In addition, the Ministry gets additional information from other sources such as Nutrition SMART surveys, small scale surveys and rapid assessments, seasonal assessments (short and long rains), sentinel surveillance (collects data at household - through the National Drought Management Authority – date on MUAC, food consumption score and coping strategy), KAP Surveys (MIYCN KAP surveys include Minimum Acceptable Diet, Minimum Meal Frequency, Minimum Dietary Diversity, WDDD), program coverage assessments, large scale surveys KDHS, KIHBS, KNMS and special surveys and studies.

The Ministry of health continues to respond to all forms of malnutrition through the following actions:

- Identify relevant nutrition-sensitive activities to prevent malnutrition and engage stakeholders to implement community nutrition actions (CNAs);
- Scale up nutrition education and counselling for improved maternal, infant, and young child feeding behaviors and practices;
- Conduct integrated outreach programs as malnutrition levels have remained high; and
- Improve coverage of ongoing high impact health and nutrition interventions.

The Ministry of Health units at national and country levels have clearly laid out roles to deliver the national vision of *a healthy, productive and globally competitive nation. The respective roles are described in the table below.*

National Government Roles	**Country Governments' Roles**
Health policy and guidelines	Promoting the primary health care
Health regulation- Standards	Provision of health facilities and pharmacies
National referral health facilities and other national institutions	The provision of ambulance services
Capacity building	Control and licensing of food selling agencies in the counties surveillance and response of disease
Technical assistance to counties	Drug abuse control together with pornography
Research	Public health and sanitation
	Cemeteries, funeral homes, crematoria, refuse dumps, solid waste disposal

In addition, there are concurrent roles that the two levels of government carry out at their respective levels, with the national level dealing with policies, while the country level deals with implementation of the policies. These measures include:

i) Resource mobilisation
ii) Quarantine administration
iii) Disaster preparedness
iv) Emergencies/outbreaks
v) Partnerships (public and private), including intergovernmental relations
vi) Planning and budgeting
vii) Legislation
viii) Monitoring and Evaluation
ix) Disease prevention and control (policy and coordination)
x) Procurement of health products and technologies
xi) Health Information systems
xii) Health financing (Policy and regulation)
xiii) HRH management and development

7. ROLE OF NUTRITION AND MONITORING AND EVALUATION (M&E) DATA AT UNICEF

Edward Kutondo, Nutrition Officer, UNICEF described UNICEF's role in monitoring and evaluation of the nutrition situation in Kenya. He noted that UNICEF's Nutrition M&E/Nutrition information system complements the government's system. He went on further to describe the uses of different types of data for the following:

- Situation monitoring, early warning and program planning and adjustment
- Monitoring results for children and women
- Donor information and fundraising
- Evidence for advocacy and policy

He noted that there were two different types of data: the routine data collected monthly by health facilities, which includes:

- District Health Information Software (DHIS)
- Community Health Information System (CHIS)
- Logistics Management Information System (LMIS)
- Indicators: Management of acute malnutrition, stocks, prevention of acute malnutrition (e.g. counselling).

The country also uses population-level data systems where data are collected periodically for periods ranging from one to five years:

- Kenya Demographic and Health Survey (KDHS), MICS
- Nutrition SMART surveys, Rapid assessment
- KABP surveys – dietary assessment, IYCF-E
- Coverage surveys, Nutrition causal analysis
- Sentinel surveillance – NDMA
- Short /long rains Acute Nutrition IPC analysis
- Thematic research on nutrition, capacity assessments
- Indicators: wasting, stunting, micronutrients, WASH, food security, Maternal, Infant and Young Child Nutrition.

In addition, data are collected for program monitoring and includes field visits, program reports, evaluations, lesson learning, among others.

Emerging issues

i) The following issues emerged from the discussion session following the presentations:
ii) The need to increase the role of agriculture in solving malnutrition;
iii) How to integrate community with county-level and increased participation of communities in decision-making;
iv) The need for capacity building for community health volunteers (CHVs)
v) Promotion of digital health information systems based on open data kits (ODK).

8. IMPROVING DIETARY AND HEALTH DATA FOR DECISION MAKING IN AGRICULTURE AND NUTRITION ACTIONS IN AFRICA – RESEARCH AGENDA

Nathaniel Jensen, Economist and Co-PI at ILRI, made a presentation on the proposed project, covering the challenge of collecting health and nutrition data, project vision, value of proposed solution, research questions, brief description of proposed tool and implementation and workplan.

The challenge of collecting health and nutrition data

Child (mal)nutrition is one of the most commonly used indicators for tracking SDG progress and the impacts of development interventions. Unfortunately, conventional methods for collecting child nutrition and health indicators require considerable training, are slow and difficult, and are expensive to collect

data accurately. The result is that programs operate with a minimum of data, which can misrepresent the situation. Further, such minimalistic approaches are prone to systematic errors, exacerbating such prospective mis-representation, and offer little value to participating households during the program itself.

Project vision and value proposition

The vision of this project is to develop and build capacity around a method for collecting and disseminating accurate, low-cost, high-frequency dietary and health data directly from and to households. This will be done by developing a mobile-based platform by which households can easily collect, submit, and access information on their children's nutritional and health status in near-real time and at extremely low cost. This is expected to deliver the following value:

- A dramatic reduction in the cost per data point as we liberate child health and nutrition data from the high costs of home visits by enumerators and technicians
- Higher frequency and more expansive data collection
  - → Greater understanding of household welfare dynamics
  - → Improved impact estimates
  - → More effective use of funds
  - → Complement existing surveillance and data collection systems within government sectors
- The application will provide households with dashboards of information on their children's nutrition status, at the same time improving their own capacity to make informed nutrition decisions.

Research questions

The project seeks to answer the following research questions:

1. To what extent can digital platforms be used to accurately and cost-effectively collect diet and health data directly from households?
   - How accurate are the data collected by households and which types of data can they collect most accurately?
   - What is the data-collection burden placed on participating households when compared to standard methods?
2. What additional value does the tool provide?
   - To what extent does higher-frequency data add to our understanding and tracking of diet and health outcomes?
   - Does access to reliable information on nutritional topics change households' knowledge, attitudes and behaviors regarding nutrition?
3. Which additional research opportunities does it open?
   - Can we identify new indicators that are (more) easily observed and track dietary intake as well or better than existing metrics? (e.g. # of times subjects ate meat in the last week, binary vs. quantities?)
   - How well can we use alternative approaches to track infant health? (e.g., photos and machine learning)
   - Which minimum set of dietary indicators best track health?
   - Dynamics between seasonality of consumption, and health.

Brief description of the tool

The following characterise the tool:

i) User interface: Does not require literacy
ii) Types of data:

Diet:

- Propose a menu of tick boxes for 24 hour recall
  - Household dietary diversity
  - Minimum dietary diversity score for women of reproductive age (DDS-W)
  - Minimum acceptable diets for children (MAD)

iii) Clinical symptoms
- Propose a menu of tick boxes for 24 hour recall.
  - Which symptoms?
  - Duration or frequency?

iv) Health services used: Clinic visits
v) Young child anthropometrics, e.g. MUAC
vi) Food security questions

Work Plan

The work plan is categorised into two phases: Phase 1 for developing and testing tool; Phase 2 for scaling the tool in three additional locations. The details are given in the table below.

Phase and period	**Activity/milestone**
Phase 1 (Pilot in 1 location)	
0-6 months:	Tool development and testing
	Identify and coordinate with partner project
	Institutional and national approvals
7-12 months:	Pre-pilot tool
	Community health volunteer (CHV) and household (HH) training
	Launch pilot
13-18 months:	CHV & HH data collection
19-24 months:	Close data collection exercise
	Analysis & reporting
	Draft of journal article on (i) HH data quality and value
	Stakeholder (e.g., HH, CHV, nutrition experts) feedback
Phase 2 (Scale into 3 new locations)	
25-30 months:	Identify and coordinate with partners from 3 locations (w/in & outside of Kenya)
	Institutional and national approvals
	Update tool for new settings
31-36 months:	Pre-pilot tool (3 locations)
	CHV and household training (3 locations)
	Launch pilot (3 locations)
37-42 months:	CHV & HH data collection (3 locations)
43-48 months:	Close data collection exercise
	Analysis & reporting
	Draft of journal article on (i) scalability of the tool
	Stakeholder feedback

Emerging issues

The following issues emerged from the discussions:

i) Incentives for participating households – do we need this given the need to upscale the results beyond the pilot areas? Wil this not set a wrong precedent? The feeling was the amounts were too small but could be communicated as compensation for airtime but in any case were much lower than what conventional approaches pay enumerators to collect data.
ii) Data collected by mothers: need to train them to collect data, e.g. MUAC, but need to address issues of self-referral, possibly by linking tool to health services (CHVs) in the area.
iii) Issue of low literacy can be addressed by providing lessons on how to use the devices, especially as informed by formative research in the respective areas.
iv) Need to consider cost implications of new approach compared to golden standard. Will affect experimental design.

v) Issues to consider on the app to make it user friendly and more functional:
    a. Training of respondents on how to use app
    b. Provision of complementary education on nutrition on ground
    c. Provision of animation icons to facilitate data capture by low literacy respondents
vi) Important of context – how do we compare what household supplies with the data supplied by CHV? Important to note that the proposed system would not replace the established CHV referral system. Tool must be an improvement rather than a replacement of existing systems.
vii) Scalability of smart phones – how scalable are they, given cost? Noted that simpler phones would require a higher level of literacy than smart phones, smart phones use images and audio more rather than text. Cost of smart phones is coming down, so should still work out cheaper than the conventional approaches.

9. HOW DOES THE PROJECT FIT INTO FANRPAN AND ILRI WORK ON NUTRITION?

Simba Sibanda, Project Leader, FANRPAN, presented on how this project fits into FANRPAN's strategy, while Esther Omosa, Nutrition Specialist at ILRI, described how the project will relate to ongoing work on nutrition at ILRI.

It was noted that FANRPAN's Strategic Plan 2016-2023 has three strategic goals:

1. Transformed agricultural systems through the development and implementation of evidence-based policy
2. Adequate, safe and nutritious food for all people in Africa
3. Climate change resilient and resource sustainable food systems in Africa

The project, which aims to address gaps in health and nutrition data, is within FANRPAN's strategic goal number two, achieving adequate, safe and nutritious food for all people in Africa and will provide evidence for the first strategic goal.

ILRI is participating in the Accelerated Value Chain Development (AVCD) Program whose goal is *Improved nutritional status of women of reproductive age (15-49 years) and children 0-23months in the Feed the Future zones of influence in Kenya*. This will be achieved through two objectives, namely:

- To improve access to diverse and quality foods to households in 21 counties, including ASAL
- To improve use of maternal and child health and nutrition services among women of reproductive age and children under five years.

These objectives will be supported by a good data collection system, which is proposed in this project.

10. BREAKAWAY SESSION

Break away sessions were meant to generate information from the pool of experts who participated in the inception workshop. This information was to deepen the understanding of what data would be feasible to collect. Participants worked in three groups to answer the following questions:

i) What data should the tool collect?
ii) Methods for testing the tool-functionality and comparison to traditional data collection methods
iii) Potential uses and scalability of the tool

The consolidated responses from the groups are summarised below.

Data to collect:

i) Feasibility of the tool - easy to collect data, tool should not exert extra demands on household time
ii) The tool to collect dietary data for women of reproductive age and youngest child (index child)
iii) Exclusive breastfeeding practice

iv) Use of dietary supplements by mothers
v) Possible to collect MUAC, where instead of the mother recording, the captured image should allow for reading the measurement
vi) Collect other health indicators such as diseases, breastfeeding, health seeking behaviours as well as energy saving data
vii) WASH Data:
    - Household hygiene (toilet facilities and use etc)
    - Access to safe water
viii) Sources of energy (for cooking etc)

The following variables were either considered unsuitable or questionable:

i) Weight
ii) Height – to be discussed further but may not be necessary as changes are not significant within a short period of time

Other issues to keep in mind:

i) Who will collect the data? Husband? Wife? Both?
ii) Who will make decisions on the phone such as keeping it, taking images etc?
iii) Can the tool allow for assessing quantities?
iv) Quality tests/Gold standard
    - Who is reference - CHV or other collector? Will be guided by best practice but will have bearing on experimental design
    - Can app provide better quality data than conventional approaches?
    - Data collection timing should align
    - Determine standard and levels of variability between the two approaches

Testing functionality of the Application:

- Accuracy checks—include questions for consistency check e.g. day of record, time of record
- Create routine in data collection, e.g. specific day for each variable
- Monitor fidelity and frequency of data entry (quality) for trends
- Monitor usability of app - initiate discussion/review meetings between the mothers and within the HH to identify challenges and lessons
- Identify early adopters and champions (peers) to support others

Potential use of app

- Inform communities on their dietary practices and potential areas to improve
- Will contribute to improvement of core nutrition actions promoted by NGOs and other partners
- Government decision-making on resource allocation
- Enrich the country statistics and strengthen the credibility of statistics used by national bureaus
- If more cost effective, it will increase the coverage of nutrition- help NGOs and governments in programing
- Help donors in resource allocation and holding their partners and communities accountable for resources
- Will improve timelines of interventions
- Opportunity for frequent longitudinal data, address gaps in conventional data collection approaches based on periodic surveys
- Data on intermediate indicators as proxies for outcome indicators such as stunting
- Act as an early warning system (e.g., MUAC), lead to early response
- Data can be used for programming and policy targeting
- Tool can include (i) process indicators, (ii) referral mechanism
- Include feedback loop to mothers.

Emerging issues

The following issues will need to be resolved:

i) Measurement of quantities of different food consumed, in addition to DDS
ii) When to collect data in the week?
    a) Take account of special days (fasting, market days or festivals)
    b) Tool can capture both special days DDS and ordinary days by collecting data more frequently, including ordinary and special days and then analyzing the impact or variation caused by the factor.

11. GENDER DYNAMICS

Participants were urged to seriously consider gender dynamics within the participating households and how these will affect expected results. The issues to consider included the following:

- Whose dietary diversity score: considering intra-household food allocation
- Decision-making in household: patriarchy, control over smart phone
- Processes
    - Need for training and sensitization of women, men
    - Who keeps phone?
    - Who enters data?
- Outcomes
    - Possibility of backlash from men
    - Incentives: if given to men, then women may get demotivated
    - Impact of project on women's time - effect on data quality
    - How can use of app contribute to changing norms or entrenching status quo? E.g. men's responsibility for child nutrition
- Documentation and tracking of changes important - record qualitative data
- Do no harm! Observe this principle as a guideline in all engagements with community members

12. METHODOLOGY - THE TOOL, RESEARCH DESIGN AND IMPLEMENTATION

Nathan presented and led the discussion on the methodology, research design and implementation. The draft work plan had been discussed previously (see Section 8).

Research design during pilot phase

The proposed research design during the pilot phase was as follows:

- 200 households from 20 communities
    - It was assumed that this would mean 20 CHVs, but it seems that this could include as few as 1 CHV.
    - In order to minimize the impact of any single outlier CHV on the study, the suggestion is that the target be 20 communities.
- The pilot phase will include 12 months of data collection
    - Some of this will be in the initial phases, after which the app will be updated iteratively. The result is that the pilot dataset will likely contain data that crosses changes in collection procedures/questions/protocols as we learn.
    - Plan is to vary incentives as well as monitoring methods to test their impacts on compliance and accuracy.
    - The suggestion is that qualitative methods be used to develop acceptable protocols and incentives during the pilot and then experiment with them in the scaling so that there is no risk conflating the main objective with this objective on optimal incentives and monitoring.

- Participants will be paid a small stipend (~USD 0.25-0.5/submission plus compensation for airtime) to submit daily information on their family's diets and weekly information on child health, including clinical (e.g., coughs, diarrhoea, coughs, stomach pains, constipation) and anthropometric data (e.g., MUAC).
- Assuming participation rates of 80% and that participating households submit 80% of daily and weekly data requested, the 200 households will submit 46,720 surveys on daily consumption and 6,656 surveys of child health by the end of the 12-month program.

If semi-weekly consumption data is to be requested instead, there still would be 13,312 surveys on each person's diet.

HH Tool : Software Features

- User experience: flexibility in question and input design including GPS, image, audio, icon
- A case management structure which allows current surveys to draw from registration data (e.g., name, age), and previous surveys (e.g., MUAC).
- Operates well in environments with poor mobile coverage and low bandwidths
  - Fully operational offline
    - Full surveys are stored on the device until uploaded
    - Registration and key data points from previous surveys are stored on the device
  - Surveys are relatively small to send
  - Not a lot of back and forth required
- On-device figures presenting historic data with some small on-device analysis

HH Tool: Survey features (specific questions aside)

- Responses are related to a specific individual; we are tracking individuals over time.
- Meta data: Timestamp, GPS, who is completing the survey?
- "Validating effort questions" such as time, month, changing simple lesson/response (e.g., A simple lesson on nutrition followed by a question that was just stated.)
- How much of the mother's time are we prepared to take each month?
- We could write different surveys for different items (frequencies)
  - Consumption/HDDS
  - Young child clinical symptoms
  - Young child anthropometrics (MUAC)

  This would simplify varying collection rates but complicates the individual's interactions with the app.

CVH Tool: HH Tool, HH Tool+ ?

Assuming, for the moment, CHVs are already collecting a battery of M&E indicators for the HHs monthly, what are we asking?

- Should our tool be an exact copy of the HH tool?
- Adjustments for:
  - BFCI data collection
  - "Gold standard" data
    - Weight
    - Height
    - Additional clinical symptoms
  - Other?

Emerging issues:

i) Need to define the unit of community – is it a village or the area covered by each CGV? Also need to consider number of households in each village.

ii) Need for control or counterfactual in the design. Necessary as we consider what we are going to compare with as the golden standard and reduce confounding factors. The following possible scenarios may be considered in the design:
   - CHV-based system;
   - App plus CHV collecting traditional data for comparison;
   - App alone with no CHV

iii) Qualitative data to help in interpreting the results should be part of the research protocol. Will need participation of social scientist

iv) Need to regulate order of household vs CHV data submissions/collection. Who should start, especially in scenario two above.

13. MONITORING AND EVALUATION

Tshilidzi Madzivhandila, Director of Policy Research and M&E Specialist at FANRPAN, presented the project results framework and impact pathway which will be used as a basis for an M&E plan. A number of points were noted as follows during the discussion:

i) There will be no phasing of project activities, hence will not need mid-term review

ii) Need to review health aspects in the wording of the results framework as currently it is largely focusing on nutrition data/indicators

14. REVIEW OF WORK PLAN

A detailed work plan, based on the milestones (See section 8), with sub-activities and Gannt chart, was presented and discussed. It was noted that some timelines were already behind schedule and should be adjusted. Adjustments will be made and the work plan shared with the team.

15. PROJECT STRATEGIES

The project will need to develop strategies on gender, communication, capacity development and open access to data following IDRC guidelines and other sources.

Gender Strategy

The gender strategy should aim to create a conducive environment where equality moves to equity, looking not only at access for all, but access for even those who are most vulnerable. It is necessary to integrate gender in funding cycle and app design – women participation and men involvement. The strategy should ensure that projects are designed to remove barriers to achieving equity and should consider three main issues:

1. Implementation
   - What kind of training, sensitisation on gender and social dynamics needs to happen before implementation for both CHVs and households
   - Intra-household dynamics on asset ownership, incentives, decision making on use of phone, incentive
   - Implications of data collection on time
   - How does focus on mothers reinforce child care as women's responsibility
   - How to engage men
2. Research
   - How do we factor in intra-household food allocation in the tools (whose data being monitored?)
   - How to factor decision making
   - Qualitative tools to track gender and social dynamics
3. Outcomes
   - What kinds of empowerment outcomes do we anticipate

- Do no harm principle

Communication Strategy

The communication strategy has to support the project answer why it is needed, when it is needed and how it should be done. There is need to consider the financial, time and human resources for communication in the proposed project.

For IDRC, communication is key. IDRC considers internal and external communication. Internal communication mechanisms need to be set up at an early stage to ensure smooth coordination, avoid delays and misunderstandings. Communication addresses challenges and promotes transparency, trust, common visioning, decentralised decision making, sharing and learning.

External communication targets audiences at local, national, and international levels. These include the research community, development community, policy makers, private sector, farmers, NGOs, media and the general public.

The communication strategy should answer the how of reaching the audience. This will be made possible if the project:

- Knows its audiences and what it expects from them
- Is opportunistic: target and use key influencers to help deliver the messages
- Leverages the media to provide editorial coverage
- Identifies a spokesperson: agree on specific key messages and be coherent
- Outreach to grassroots organizations/non-profit groups with a vested interest in the project topic
- Attend strategic events: arrange one-on-one meetings with key influencers
- Cultivate links and relationships with key decision makers
- Choose appropriate dissemination channels (social media, newspapers..)

The communication strategy should also explain how the project can adapt to the audience. This can be achieved through understanding where and how the targeted audiences seek and receive information, Know what issues are important to key audiences, why and what should they know about the research and think in advance what the project expects from the audience (attention, money, action).

The strategy should clearly spell out the anticipated outputs and where these would be disseminated. These outputs may include audio visual materials, academic and peer reviewed publications, brochures, booklets, charts and posters, policy publications, project websites, power point presentations, speeches, outcome stories, etc. These outputs could be disseminated through academic journals, IDRC/GAC, local media, international media, website newsletters, social media and strategic events.

When it comes to acknowledgements, IDRC and Global Affairs Canada's contributions must be acknowledged on ALL project-related publications, communication materials, and project outputs (regardless of format), announcements, activities, speeches, lectures, interviews, and website.

Key considerations within a communication strategy:

- Identify and communicate emerging outcomes throughout the project (don't wait until final results)
- Leave space for "unexpected" outcomes
- Review/adjust your communication strategy every year
    - You are experts in research, are you experts in communications? If not, hire help!
- Your research is vital, but if not communicated: "SO WHAT?"

Capacity Development Strategy

The capacity development strategy will cover three areas:

i) Training of participating households in use of tool and general nutrition

ii) Training of CHVs
iii) Participation of graduate and post-graduate students

The first two areas have been discussed elsewhere in this report. The issues pertaining to student participation are as follows:

i) Graduate student engagement was commended but need to consider the following:
   - Possibility of budget cofounding with sponsoring university
   - Incorporate student in project activities that are already budgeted for
   - IDRC has no separate budget for students outside the project funds
   - Need to sell idea to USA and Canadian partner universities because of innovation area.

ii) Areas for student input:
   - Nutrition data quality and seasonality
   - Computer science – algorithm application development/testing
   - Gender justice investigations
   - Possibility of interesting local universities

Research Ethics

Before implementation of field activities, ILRI will obtain ethical clearance from the appropriate national and institutional boards. On the national level, there is already clearance from the Research in Nutrition Technical Working Group, the first step to national clearances. Such clearances have provisions for how to securely handle personal data and processes for moving that data into the public domain:

- Consent
- Dropping all personal indicators-name, identity numbers, phone numbers
- Adding error to indirect indicators to anonymise
   - Add random error (U[-5,5]km) to latitude and longitude
   - Add random error (U[-2,2]month) to child birth month

Data handling

1. Raw data will be sent from smartphone to a server.
2. The data will be stored there and downloaded to and saved on two ILRI computers.
3. The raw data will be cleaned and anonymized.
4. The resulting clean dataset will be shared with the project team, along with a codebook.
5. The raw data will be held and available to the project team as well as future collaborators on request, if needed, and with protocols on what is sent and how it is used.
6. The clean dataset and codebook will be stored on a server where it is freely available to the public 12 months after the end of the project.
7. Before the end of the embargo, interested collaborators are welcome to submit research proposals, which, if accepted by the steering committee, would give them access to the data before the end of the embargo.

APK

- As much as possible, the AKP will be developed from existing open source software.

Dissemination of Results (Outputs)

Dissemination of results will be in accordance with IDRC's Open Access Policy which is available at http://www.idrc.ca/EN/Misc/Pages/Open-Access-Policy.aspx. All project outputs must be made available to the public on an Open Access basis.

16. PROJECT GOVERNANCE AND MANAGEMENT

Project Governance

FANRPAN is the lead, with Simba Sibanda as Project Leader
ILRI leader: Nathaniel Jensen
FANRPAN and ILRI will manage day-to-day activities of the project, with support from a Steering Committee. The Steering Committee (SC) will comprise the following representatives of FANRPAN, ILRI, and field project host institution. The role of the SC will be to review progress reports and ensure project remains on course to achieving its objectives. It will meet quarterly, with at least one face-to-face meeting per year.

External Advisory Committee (EAC)

The EAC will provide oversight over the project. It will comprise the following:

- Individuals working on nutrition and maternal/infant health at local, national and international levels
- Local level: Community health volunteer or nutritionist from one of the regions where project will be working
- National level: individuals from either UNICEF or WFP in Kenya
- International: Faculty member from Cornell University.

Reporting Guidelines

Financial and technical reporting guidelines and timelines are included in the grant agreement. Annie Wesley covered the detailed reporting requirements. The following points are noteworthy:

Technical reporting

i) The technical report is tied to the financial report and disbursement
ii) It allows implementers and IDRC to understand project progress
iii) Final technical report should be made available to the public, subject to guidelines of global access
iv) There is a monitoring questionnaire to be completed which covers field activities, beneficiaries, and publications, among other things.

Financial reporting

Guidelines on allowable expenses , e.g. per diems: use your own institutional system up to the maximum allowable by IDRC.

Appendix 1. List of Participants

Name	Organization
1. Paul Otieno	Action Against Hunger (ACF)
2. Bertha Munthali	FANRPAN
3. Munhamo Chisvo	FANRPAN
4. Simba Sibanda	FANRPAN
5. Tshilidzi Madzivhandila	FANRPAN
6. Annie Wesley	IDRC
7. Jemimah Njuki	IDRC
8. Edwin Kangethe	ILRI
9. Esther Omosa	ILRI
10. Iain Wright	ILRI
11. Isabelle Baltenweck	ILRI
12. Kibrom Abay	ILRI
13. Nathaniel Jensen	ILRI
14. Nils Teufel	ILRI
15. Philemon Chelanga	ILRI
16. Polly Ericksen	ILRI
17. Sarah Kasyoka	ILRI
18. Betty Samburu	Ministry of Health
19. Lucy Kinyua	Ministry of Health
20. Elsie Nzale	Save the Children
21. Edward Kutondo	UNICEF
22. Laura Kiige	UNICEF
23. Lucy Maina	UNICEF
24. Irene Nyauncho	World Vision

Appendix 2. Programme

Time	Activity	Resource Person	Chair
Day 1, 1 November			
0830-0900	**Registration**	**JVC- 1**	
0900-1030: Official Opening and Project Launch			
0900-1030	Welcome address	Iain Wright, Deputy Director General; Research and Development-Integrated Sciences	Polly Ericksen, Program Leader, Sustainable Livestock Systems, ILRI
	Opening remarks by FANRPAN Chief Executive Officer	Munhamo Chisvo, CEO, FANRPAN	
	Remarks by IDRC Representative	Kathryn Toure, IDRC Regional Director, Sub-Saharan Africa	
	Official opening and launch of project	Betty Samburu, Senior Nutrition Officer at Ministry of Health	
	Objectives of Meeting	Simba Sibanda, Project Leader, FANRPAN	
	Introduction to IDRC	Annie Wesley: Senior Program Specialist, IDRC	
1030-1100	**Health Break (Tea/Coffee) and group photo**	**JVC- 1**	
1100-1230: Technical Session			
1100-1115	State of nutrition in ASAL regions of Kenya and the role of the Ministry of Health (MoH)	Lucy Kinyua, M&E Manager, Nutrition and Dietetics Unit, Ministry of Health	Simba Sibanda, Project Leader, FANRPAN
1115-1130	Role of nutrition and Monitoring and Evaluation (M&E) data at UNICEF	Edward Kutondo: Nutrition Officer, UNICEF	
1130-1200	Improving Dietary and Health Data for Decision Making in Agriculture and Nutrition Actions in Africa – Research Agenda	Nathaniel Jensen, ILRI	
1200-1230	How does the project fit into FANRPAN and ILRI work on nutrition?	Simba Sibanda and Esther Omosa, AVCD Senior Nutrition Specialist	
1230-1330	**Lunch Break**	**Poolside**	
1330-1500	Breakaway discussions on: i) What data should the tool collect? ii) Methods for testing the tool-functionality and comparison to traditional data collection methods		Simba Sibanda

Time	Activity	Resource Person	Chair
	iii) Potential uses and scalability of the tool		
1500-1515	**Health Break (Tea/Coffee)**	**JVC- 1**	
1515-1600	Report back and discussion of group outputs	Group rapporteurs	Simba Sibanda
1600	**End of Day 1**		
Day 2, 2 November 2018			
0830-0900	Recap of Day 1	Simba Sibanda	
0900-1000	**Methodology** - The tool, research design and implementation	Nathaniel Jensen	Munhamo Chisvo, CEO, FANRPAN
1000-1030	**Health Break (Tea/Coffee)**	**JVC- 1**	
1030-1130	**Monitoring & Evaluation** - Review development outcomes, results framework, impact pathway, M&E plan (indicators, baseline and targets)	Tshilidzi Madzivhandila (TM), FANRPAN	
1130-1230	**Review of work Plan** - Match work plan with the budget and review milestones for first 6-12 months and roles	Simba Sibanda	
1230-1330	**Lunch Break**	**Poolside**	
1330-1400	**Gender Strategy** - Share experiences and project strategy	Jemimah Njuki, IDRC	Esther Omosa, Nutrition Specialist, ILRI
1400-1430	**Communication Strategy** - Discuss and agree on internal and external communication, branding, awareness and advocacy strategy	IDRC	
1430-1500	**Capacity Development Strategy** - MSc students and post docs, their role and possible topics	TM	
1500-1515	**Health Break (Tea/Coffee)**	**JVC- 1**	
1515-1530	**Open Access Strategy** - Discuss and agree on data storage, sharing and publications strategy	Nathaniel Jensen	Edwin Kangethe, Nutrition Specialist, ILRI
1530-1600	Project Governance and Management	Simba Sibanda	
1530-1630	Technical and Financial Reporting Guidelines	IDRC	
1630-1645	Closing remarks	Munhamo Chisvo, CEO, FANRPAN	

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